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Forest Service

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FS-228

Port-Orford-Cedar

An American Wood

Uniform texture, good machining properties, moderate shrinkage, resistance to warp and decay, lightness and strength, and good paint-holding characteristics make Port-Orford-cedar desirable for a variety of uses. Logs, exported mostly to Japan, bring higher prices than logs of any other North American conifer. Japanese builders and woodcrafters favor the wood for woodenware, novelties, and toys, and for the construction and repair of houses, shrines, and temples. Future growth and management of this valuable tree, known also for its grace in ornamental plantings, is seriously threatened by a fatal root rot that is still spreading.

F-262270

Port-Orford-Cedar

(Chamaecyparis lawsoniana (A. Murr.) Parl.)

Janet L. Ohmann[1]

Distribution

Port-Orford-cedar's natural range is restricted to the Pacific Coast from near Reedsport, Oreg., to the Mad River drainage in Humboldt County, Calif. The species is common only west of the Coast Ranges and Siskiyou Mountains summit, but it ranges farther inland near the Oregon-California border, and several separate populations exist almost as far inland as Mt. Shasta and the Trinity Mountains in northern California (fig. 1).

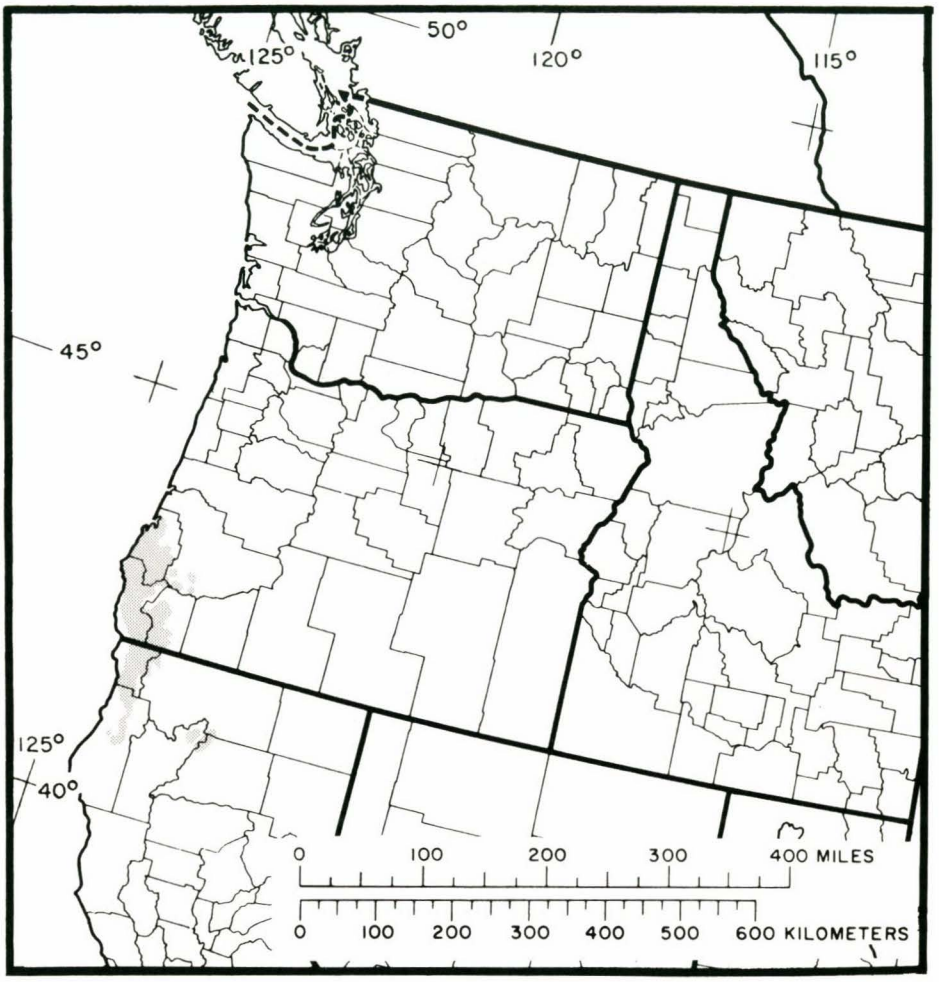

Figure 1—Natural range of Port-Orford-cedar. F-532732

Port-Orford-cedar typically grows in mixed stands, either singly or in small groups. In a limited area of southwestern Oregon between Coos Bay and Port Orford, the species grows in small, nearly pure stands. In coastal forests it grows primarily with Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), grand fir (*Abies grandis*), western redcedar (*Thuja plicata*), redwood (*Sequoia sempervirens*), and tanoak (*Lithocarpus densiflorus*). Further inland and at higher elevations it is found with Douglas-fir, tanoak, sugar pine (*Pinus lambertiana*), western white pine (*Pinus monticola*), Jeffrey pine (*Pinus jeffreyi*), ponderosa pine (*Pinus ponderosa*), incense-cedar (*Libocedrus decurrens*), white fir (*Abies concolor*), and Pacific madrone (*Arbutus menziesii*).

Port-Orford-cedar interests ecologists because of its ability to survive in diverse habitats within its restricted geographical range: from sand dunes along the coastal strip to interior valleys and higher elevations in the Siskiyou Mountains; from swampy sites to rocky, dry ridges. The tree frequently appears on serpentine soils in the inland portion of its range.

A destructive root disease caused by the fungus *Phytophthora lateralis* Tuck. & J. A. Milb., first discovered in Port-Orford-cedar's natural range in 1952, now affects the species over much of its range. Though the disease has decimated many stands in the area where Port-Orford-cedar grows best, scientists doubt that the disease threatens the biological survival of the species, because it regenerates quite aggressively. Rather, the fungus is expected to make the tree much rarer in mature forests.

Description and Growth

Mature Port-Orford-cedar trees frequently grow to diameters of 50 to 70 inches and heights of 200 feet, and live 500 or more years. The foliage forms fine, horizontally flattened, feathery or fernlike sprays. The scalelike leaves are small, paired, and blunt. The small, rounded cones, composed of 7 to 10 rounded, slightly hard scales, mature in 1 year (fig. 2). The bark—6 to 10 inches thick on old trees—is silvery-brown, fibrous, and divided into

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rounded ridges separated by deep, irregular furrows (fig. 3). Port-Orford-cedar has numerous small lateral roots, which commonly graft within and among trees.

Port-Orford-cedar has unusual ability to survive and grow in a variety of conditions. Seedlings can grow either under a forest canopy or as pioneers in open areas. The species reproduces well naturally in small clearcuts and partial cuts having an ample seed scource. Trees in pure stands and those not overtopped by other trees grow rapidly but usually more slowly than Douglas-fir on fertile soils. Port-Orford-cedar usually remains in the canopy of mixed stands up to 25 years, after which it is usually overtopped by other trees and grows slowly. A shade-tolerant tree that may live for years in the understory, Port-Orford-cedar retains to a very old age its capacity to respond to more light and space. Shorter lived competitors gradually disappear from older stands; Port-Orford-cedar and hemlock frequently dominate old-growth forests more than 400 years old (fig. 4).

The species achieves maximum growth on medium-textured soils in areas where ample moisture is available. The thick-barked mature Port-Orford-cedar (fig. 3) appears more fire resistant than other shade tolerant species. The species would probably be more restricted if it were not for this tolerance to both shade and repeated fire and its pioneering ability.

Because of its pleasing appearance, Port-Orford-cedar has been widely used for ornamental planting both within and beyond its natural range. More than 200 horticultural varieties have been developed. The fernlike foliage is also collected for the greenery market.

Phytophthora lateralis root rot seriously threatens future growth of both natural and ornamental Port-Orford-cedar. The disease is expected to reach all but the

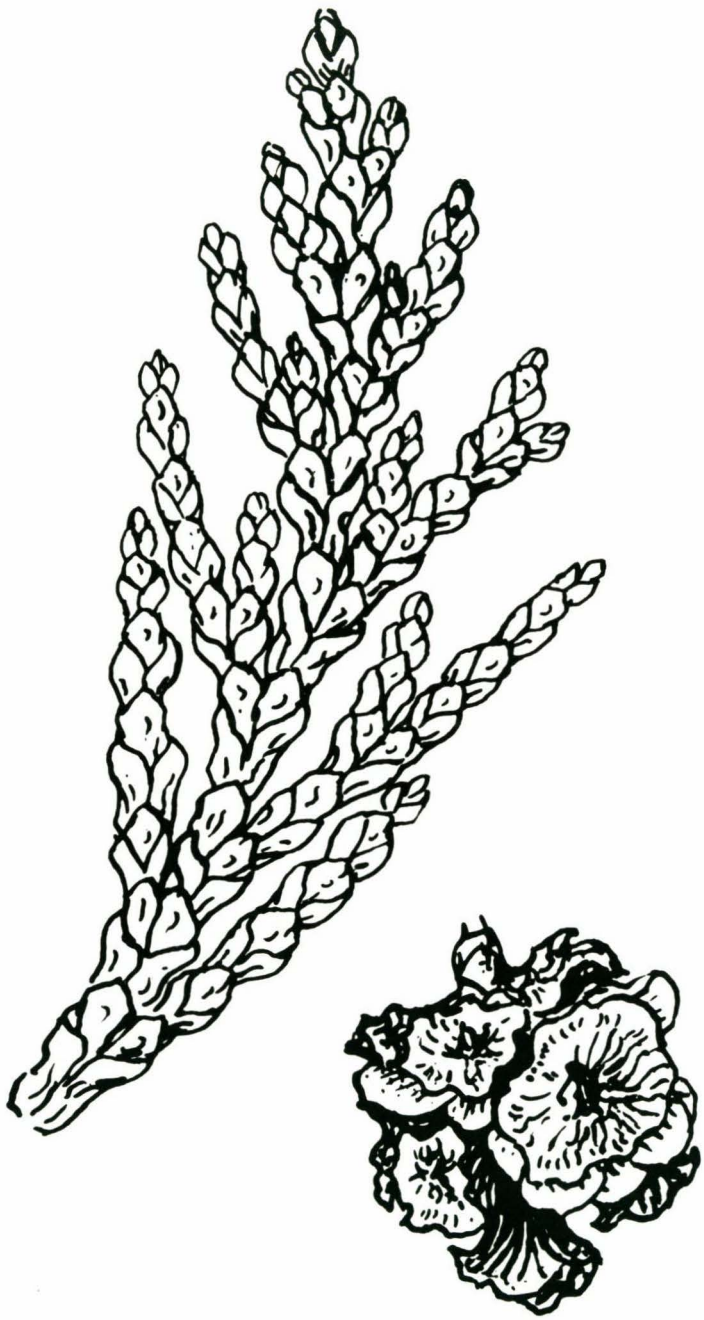

Figure 2—Port-Orford-cedar leaves and cones. Two small seeds are borne under each cone scale.

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Figure 3—Old growth Port-Orford-cedars are quite fire resistant, and vigorous specimens often have deep basal fire scars. Note bark characteristics (Siskiyou National Forest, Oreg.).

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most isolated stands, killing most trees in replacement stands before they reach merchantable size. Neither resistance to the disease nor an effective treatment has been identified. The disease's infectiousness seriously limits control through stand management. Present forestry practices are accelerating spread of the fungus, which is transmitted primarily through earth and soil-water movement. Some stands may ultimately be managed by preventing the entry of contaminated machinery, livestock, and nursery stock.

Common Names

The tree's most common name, Port-Orford-cedar, was first applied to lumber shipped from Port Orford, Oreg., to San Francisco in 1894. The names Port-Orford white-cedar, Oregon-cedar, and white cedar are used less frequently. The name Lawson cypress is widely associated with ornamental use of the tree.

Related Commercial Species

Because the species contributes relatively little volume to overall timber supply and production, resource estimates often combine Port-Orford-cedar with other species of minor importance.

The extremely high economic value of the wood, attributed to its many desirable qualities and limited availablity, discourage marketing it with other commercial species.

Supply

Oregon's timberlands contain 161 million cubic feet of Port-Orford-cedar growing stock (trees 5 inches diameter at breast height or larger). An estimated 4 million cubic feet of Port-Orford-cedar grows on California timberlands.

Rapid depletion of old-growth forests and the fatal *P. lateralis* root rot have reduced supplies of Port-Orford-cedar.

Figure 4—Mature stand of Port-Orford-cedar in southwest Oregon. Note the dense understory of evergreen shrubs.

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Production

Sawing of Port-Orford-cedar lumber began in the 1850's, and high production was achieved in the 1880's. By 1916 an estimated 40 million board feet was being cut annually in Oregon sawmills. In the early 1940's the annual cut for lumber production averaged roughly 62 million board feet, and about 29 million board feet was cut into veneer and dimension lumber.

Domestic use of Port-Orford-cedar has since decreased markedly. In 1960 only 1,671,000 board feet of domestic lumber was produced. By the early 1970's domestic manufacturing used probably less than 500,000 board feet a year.

Port-Orford-cedar logs, which bring higher prices than those of any other conifer in the United States, have been exported to other countries—principally Japan—since the early 1900's. Virtually all Port-Orford-cedar currently harvested is exported to Japan; however, exports have declined steadily since the 1960's (fig. 5).

Characteristics and Properties

The 1- to 3-inch-wide sapwood of old-growth Port-Orford-cedar varies from nearly white to pale yellowish white and is often indistinguishable from the heartwood. The heartwood appears yellowish white to pale yellowish brown. The wood has a fine texture; the grain is straight and even. Earlywood (wood produced early in the year) usually occupies most of the annual ring; the transition from earlywood to slightly denser latewood is gradual.

The wood has a characteristic pungent, gingerlike odor caused by a volatile oil, and a somewhat bitter, spicy taste. Because continual inhalation of this oil can cause kidney complications, millworkers usually wear masks.

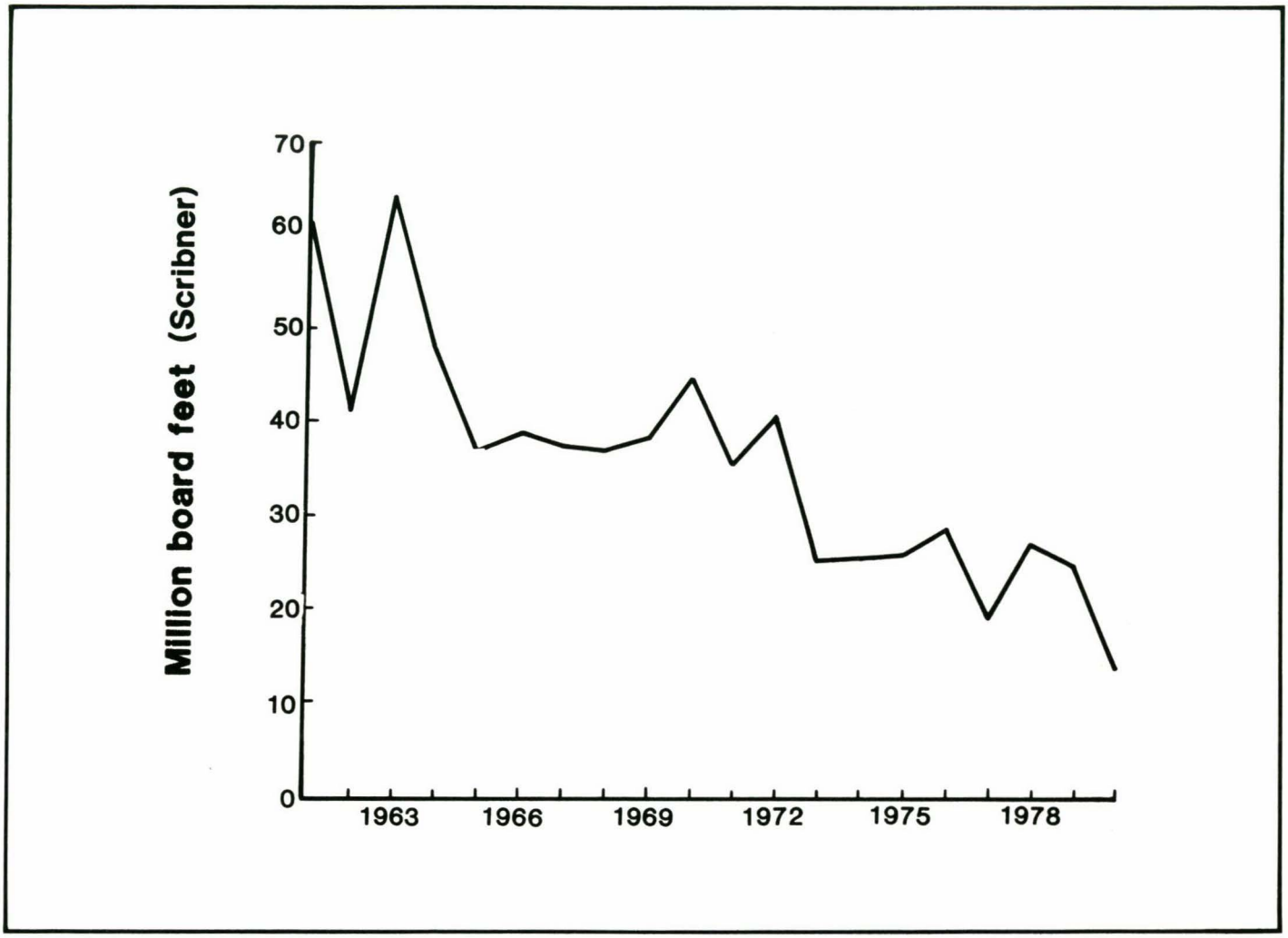

Figure 5—Port-Orford-cedar log exports from Oregon and Washington to all countries, 1961–80.

Port-Orford-cedar is moderately light in weight (specific gravity 0.39, based on green volume and oven-dry weight; density about 30 pounds per cubic foot at about 12 percent moisture); for its weight, however, it is stiff, strong, hard, and fairly shock-resistant. It shrinks only slightly during drying, dries quickly after wetting, and has little tendency to warp. It is easily worked with tools. The wood has good electrical resistance and is moderately resistant to acids.

The heartwood is highly resistant to decay. It polishes well and holds paint longer than most other woods. Unprotected wood weathers to a light gray with a silvery sheen. It does not develop weather checks.

The characteristics and properties of wood from second-growth trees are less desirable than those of native old-growth trees.

Principal Uses

The small amount of Port-Orford-cedar not currently exported is used primarily in archery, for arrow shafts. It was previously the principal wood used for storage-battery separators. It was also used for venetian blind slats; sashes, doors, and interior-finish millwork items; mothproof linings for boxes and closets; boats; matches; general construction; and water tanks, bridges, dock planking, railroad ties, and mine timbers.

The Japanese substitute imported Port-Orford-cedar wood for their native hinoki, or white cedar (*Chamaecyparis obtusa*), which was favored for centuries by Japanese builders and woodcrafters. They value the wood highly

for their woodenware, novelty, and toy industries, and for construction and repair of houses, shrines, and temples.

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